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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,537	06/04/2001	Carl J. Radens	FIS920000011US2(13312A)	4948
32074	7590	11/06/2003	EXAMINER	
INTERNATIONAL BUSINESS MACHINES CORPORATION DEPT. 18G BLDG. 300-482 2070 ROUTE 52 HOPEWELL JUNCTION, NY 12533			LEWIS, MONICA	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/873,537

Applicant(s)

RADENS ET AL.

Examiner

Monica Lewis

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. This office action is in response to the appeal brief filed June 30, 2003.

Response to Amendment

2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Response to Arguments

3. Applicant's arguments with respect to claims 22-30 have been considered but are moot in view of the new ground(s) of rejection.

Priority

4. An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Art Unit: 2822

6. Claims 22-24, 26 and 27 are rejected under 35 U.S.C. 102(a) as being anticipated by Huang (U.S. Patent No. 6,156,648).

In regards to claim 22, Huang discloses the following:

a) a substrate (200) having a first level of electrically conductive features (For Example: See Figure 2F);

b) a patterned anti-fuse dielectric layer (204) formed on said substrate, wherein said patterned anti-fuse dielectric layer includes an opening to at least one of said first level of electrically conductive features (For Example: See Figure 2F);

c) a patterned interlevel dielectric material (206) formed on said patterned anti-fuse dielectric layer (For Example: See Figure 2F);

d) vias, at least one of said vias has a via space formed above said opening (For Example: See Figure 2F); and

e) a second level of electrically conductive features (230) formed in said vias and via spaces (For Example: See Figure 2F).

In regards to claim 23, Huang discloses the following:

a) substrate is composed of an interlevel dielectric material (For Example: See Figure 2F).

In regards to claim 24, Huang discloses the following:

a) interlevel dielectric material is composed of an inorganic semiconductor material selected from the group consisting of SiO_2 , Si_3N_4 , diamond, diamond-like carbon and fluorinated doped oxides (For Example: See Column 3 Lines 33-35).

In regards to claim 26, Huang discloses the following:

a) first and second levels of electrically conductive features are composed of the same or different conductive metal selected from the group consisting of aluminum, tungsten, copper, chromium, gold, platinum, palladium and alloys, mixtures and complexes thereof (For Example: See Column 3 Lines 25 and 26 and Column 4 Lines 12 and 13).

Art Unit: 2822

In regards to claim 27, Huang discloses the following:

a) anti-fuse dielectric layer is a dielectric material selected from the group consisting of SiO₂, Si₃N₄, Si oxynitrides, amorphous Si, amorphous C, H-containing dielectrics, carbon, germanium, selenium, compound semiconductors, ceramics and anti-reflective coatings (For Example: See Column 3 Line 30).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 25 is rejected under 35 U.S.C. 103(a) as obvious over Huang (U.S. Patent No. 6,156,648) in view of Go et al. (U.S. Patent No. 5,592,016).

In regards to claim 25, Huang fails to disclose the following:

a) interlevel dielectric material is composed of an organic dielectric material selected from the group consisting of polyimides, polyamides, paralyene and polymethylmethacrylate.

However, Go et al. ("Go") discloses a semiconductor device where the dielectric material is composed of polyimides (For Example: See Column 4 Lines 39-48). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Huang to include a dielectric material composed of polyimides as disclosed in Go because they can be utilized in high temperature processes (For Example: See Abstract).

Additionally, since Huang and Go are both from the same field of endeavor, the purpose disclosed by Go would have been recognized in the pertinent art of Huang.

Art Unit: 2822

9. Claim 28 is rejected under 35 U.S.C. 103(a) as obvious over Huang (U.S. Patent No. 6,156,648) in view of Shroff et al. (U.S. Patent No. 6,515,343).

In regards to claim 28, Huang fails to disclose the following:

a) anti-reflective coating is silicon oxynitride.

However, Shroff et al. ("Shroff") discloses silicon oxynitride (For Example: See Column 2 Lines 36-43). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Huang to include silicon oxynitride as disclosed in Shroff because it aids in preventing the diffusion of impurities (For Example: See Column 2 Lines 36-43).

Additionally, since Huang and Shroff are both from the same field of endeavor, the purpose disclosed by Shroff would have been recognized in the pertinent art of Huang.

10. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as obvious over Huang (U.S. Patent No. 6,156,648) in view of Dixit et al. (U.S. Patent No. 5,233,217).

In regards to claim 29, Huang fails to disclose the following:

a) an interconnect level is formed over said patterned interlevel dielectric layer.

However, Dixit et al. ("Dixit") discloses an interconnect level disposed over an interlevel dielectric layer (For Example: See Figure 1G). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Huang to include an interconnect level disposed over an interlevel dielectric layer as disclosed in Dixit because it aids in increasing component density (For Example: See Column 1 Lines 5-68 and Column 2 Lines 1-18).

Additionally, since Huang and Dixit are both from the same field of endeavor, the purpose disclosed by Dixit would have been recognized in the pertinent art of Huang.

In regards to claim 30, Huang fails to disclose the following:

- a) interconnect level includes a tapered metal contact region.

However, Dixit discloses an interconnect level disposed over an interlevel dielectric layer (For Example: See Figure 1G). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Huang to include an interconnect level disposed over an interlevel dielectric layer as disclosed in Dixit because it aids in increasing component density (For Example: See Column 1 Lines 5-68 and Column 2 Lines 1-18).

Additionally, since Huang and Dixit are both from the same field of endeavor, the purpose disclosed by Dixit would have been recognized in the pertinent art of Huang.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 703-305-3743.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final

Art Unit: 2822

communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML

October 30, 2003



AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800